if the atomic weight of argon be 40, on subtracting 32, or twice the average difference, the number 8 is obtained, which closely approximates to $3{\cdot}9 \times 2$. Which of these views is correct time must decide.

II. "Alternate Current Dynamo-Electric Machines." By J. HOPKINSON, F.R.S., and E. WILSON.* Received April 4, 1895.

(Abstract.)

The paper deals experimentally with the currents induced in the coils and in the cores of the magnets of alternate current machines by the varying currents in and the varying positions of the armature. It is shown that such currents exist, and that they have the effect of diminishing to a certain extent the electromotive force of the machine when working on resistances as a generator without a corresponding effect upon the phase of the armature current. It is also shown that preventing variations in the coils of the electromagnet does not, in the machine experimented upon, greatly affect the result, and that the effect of introducing copper plates between the magnets and the armature has not a very great effect upon the electromotive force of the armature, the conclusion being that the conductivity of the iron cores is sufficient to produce the main part of the effect. A method of determining the efficiency of alternate current machines is illustrated, and the results of the experiments for this determination are utilised to show that in certain cases of relation of phase of current to phase of electromotive force, the effect of the local currents in the iron cores is to increase, instead of to diminish, the electromotive force of the machine.

III. "Note on the Relations of Sensory Impressions and Sensory Centres to Voluntary Movements." By H. CHARLTON BASTIAN, M.D., F.R.S., Professor of Clinical Medicine in University College, London. Received April 5, 1895.

In a recent communication to the Royal Society by Drs. Mott and Sherrington, entitled "Experiments upon the Influence of Sensory Nerves upon Movement and Nutrition of the Limbs," results of a most important and hitherto unsuspected character were brought forward. In this communication they have shown that "section of the whole series of sensory roots belonging to a limb," either upper

* The large majority of the experiments herein described were made in the summer of 1893, and a considerable part of the paper was then written. We have to thank Mr. F. Lydall, one of the student demonstrators at King's College at that time, for much assistance.